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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,598	08/16/2006	John Henry Courtenay	HLBB-P01-002	9885

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GOSZ AND PARTNERS LLP  
ONE STATE STREET  
BOSTON, MA 02109

EXAMINER
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POPOVICS, ROBERT J

ART UNIT	PAPER NUMBER
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1797

MAIL DATE	DELIVERY MODE
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12/16/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/589,598	<b>Applicant(s)</b> COURTENAY, JOHN HENRY	
	<b>Examiner</b> /Robert James Popovics/	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 21-68 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-68 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Specification***

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

#### **Content of Specification**

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.

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- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).
- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.
- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:
  - (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
  - (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."
- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

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- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.
- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).
- (k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).
- (l) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **cyclone** (claim 52), **“means for generating swirl flow”** (claims 63 68), **“means to cause admixing”** (claims 54 59 64), **“means to separate”** (claim 54 59 64) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Format***

In order to more easily read the claims, Applicant is urged to re-draft the independent claims, such that they comply with 37 CFR 1.75(i).

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***Claim Rejections - 35 USC § 103***

Claims **21-68** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of **Enright (US 4,872,908)** and **Schneider (US 2002/005667)**.

Applicant's comments regarding these references are noted:

[0001]It is known to remove both solid and gaseous inclusions from metal melts before they are cast in order to improve the quality of the casting. Several techniques are available for this purpose and one involves passing the liquid metal through the pores of a porous filter and then adding a grain refining agent.

[0002]U.S. Pat. No. 4,872,908 discloses a means of improving filtration by predisposing a pre wetted additive on the surface of a ceramic foam filter with the objective of promoting the formation of a stable filter cake leading to improved filtration. This patent does not, however, take account of the role of grain refiners in destroying the development of filter cakes and characteristics of the filter aperture required in the promotion of filter cake formation.

[0003]US-A-2002/005667 describes a three chamber filter assembly allowing addition of grain refiner rod into an intermediate chamber between the two filter chambers, the first being a ceramic foam filter whilst the second consists of a small filter bed containing spheres of alumina. Whilst the arrangement disclosed theoretically permits re-use of the first ceramic foam filter, it does not address the issue of how the rate of build up of the filter cake is to be controlled. If the filter cake build up is not controlled, this can lead to premature blocking of the filter. Moreover, bed filters of the type forming the secondary filter bed, are known to be complicated and expensive to maintain and in addition may encounter operational difficulties arising from the release of agglomerated grain refiner particles.

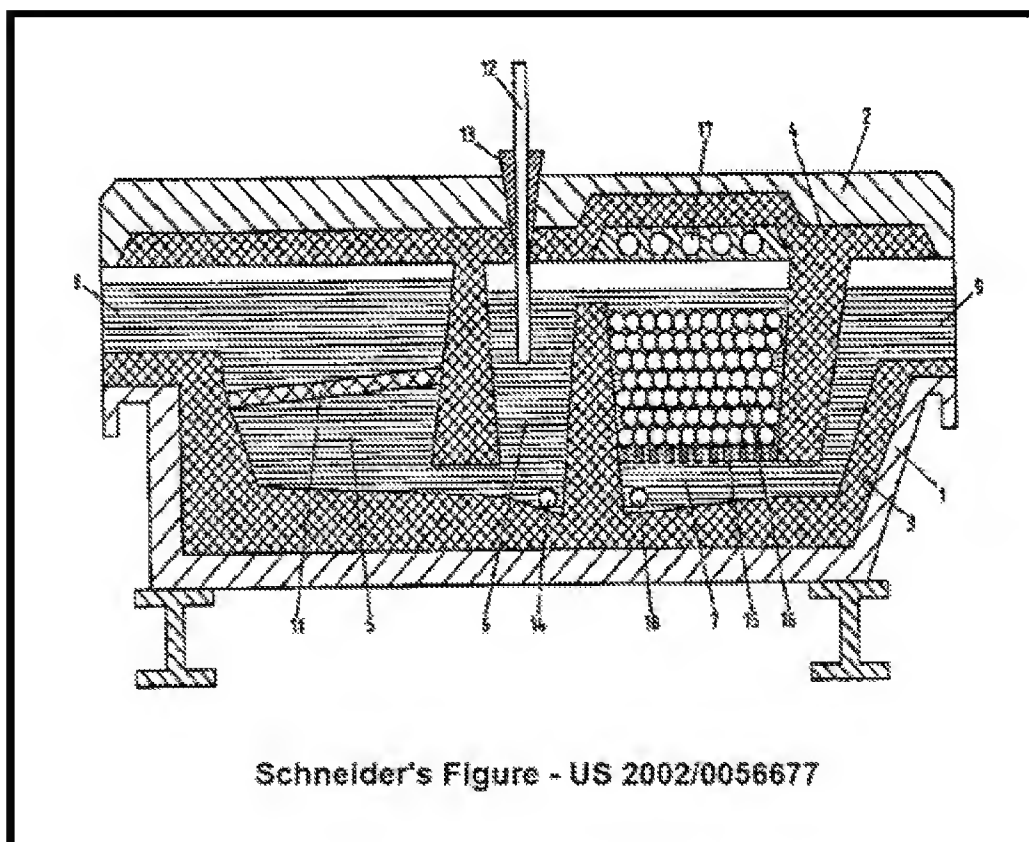
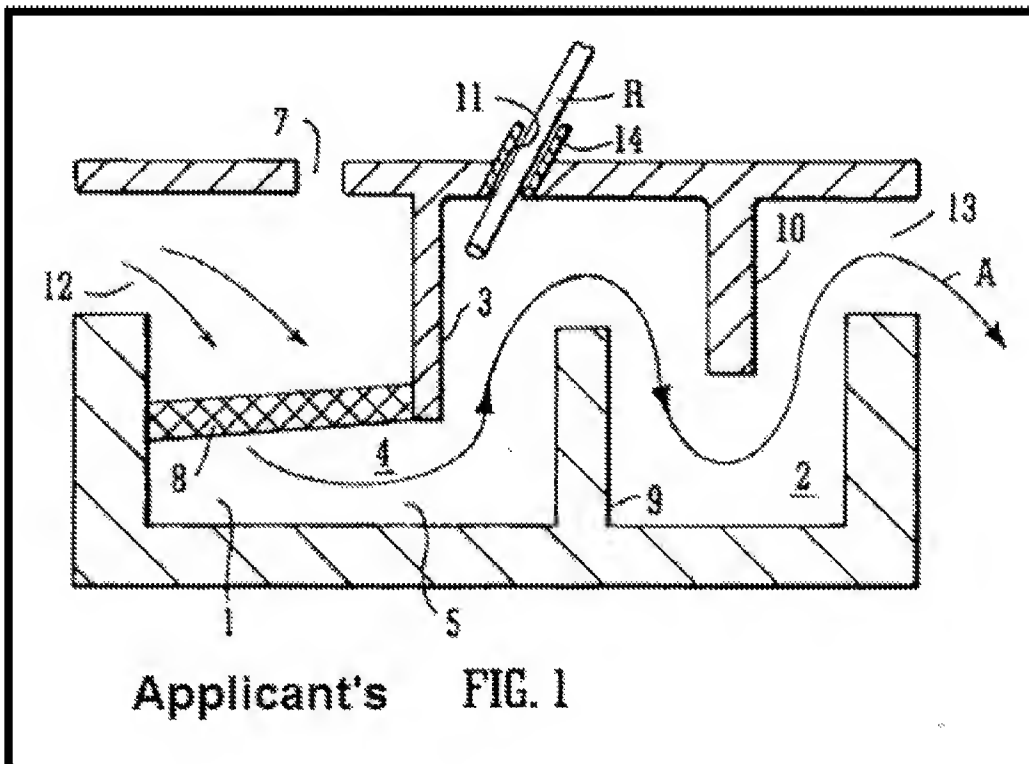
[0004]The invention is concerned with this latter technique and especially seeks to improve filtration efficiency and to prolong the life of the filter by controlling the filtration characteristics of the filter cake that forms on the filter, such as filter cake accumulation.

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[0005]In one aspect the invention provides a method of maintaining the life of a porous filter when refining a metal melt by controlling the formation of a filter cake thereon, the method comprising passing liquid metal through a porous filter and adding a filter cake formation agent to the metal; contacting the filtered metal with a grain refining agent followed by mechanical mixing to promote intimate mixing of the metal and the grain refining agent to produce refined metal, whereby a filter cake is formed on the porous filter without significant change in the metallostatic head above the filter.

[0006]The metal to be treated may typically be a light metal such as aluminium or its alloys or any other metal from which inclusions need to be reduced or removed before grain refinement.





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As clear from the comparative figures above, Applicant's structure is substantially similar to that of Schneider. The claims essentially differ from Schneider by specifying the addition a "cake formation agent." Enright (US 4,872,908 discloses the addition of a "cake formation agent" – see column 3, lines 1-67, especially, lines 33-38:

### 3

In advance of forming a filter on the substrate, particulate material, for example tabular alumina, in the size range 300 to 1700 microns is prepared (in a manner not shown) to enhance its wettability in liquid aluminium. This may involve surface coating the particles with a substance such as silver, copper, nickel, titanium, titanium diboride or other intermetallic inherently wetted by the liquid metal. Alternatively the coating may be of a substance such as a fluoride containing flux that also wets the particles. Preferably however the particles are pre-mixed with an aluminium alloy readily miscible with the alloy to be filtered and added thereto as a metal matrix composite body either as a semi-solid slurry or as a cast product thereof.

The treated particles (which are denser than liquid aluminium) are introduced to the launder 1 between points such as B and C. These particles, whether introduced as individual coated particles or as a metal matrix composite body in the form of a semi-solid slurry or as a cast product thereof, are dispersed and carried by the combined influence of liquid metal flow in the launder 1 and gravitational forces and are deposited at 9 (FIG. 2) on to the substrate 8. They are deposited in a fairly even manner and form a sharp interface with the substrate 8 as shown at 10. The deposited particles 9 remain discrete and are held against the substrate both by gravity and the continued flow of liquid metal as indicated by the arrow D.

It has been found advantageous for the deposition of particles on the substrate to be completed quickly. Firstly more successful bridging between the particles occurs when the frequency of their arrival at the surface of the substrate is high. Successful bridging reduces the opportunity for the particles to infiltrate the pores of the substrate and also a more porous filter cake is formed. Secondly we have found that the ability of the filter cake to retain inclusions from the liquid metal is reduced until the formation of the cake is completed.

**U.S. Patent**

Oct. 10, 1989

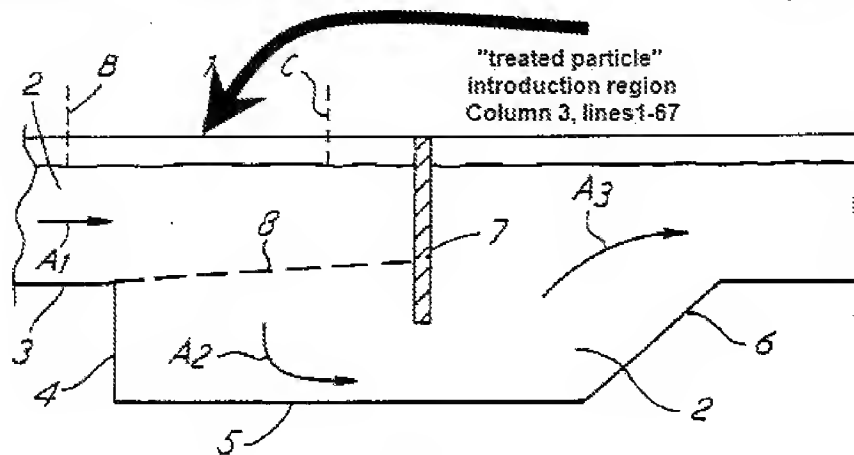
**4,872,908**

FIG. 1

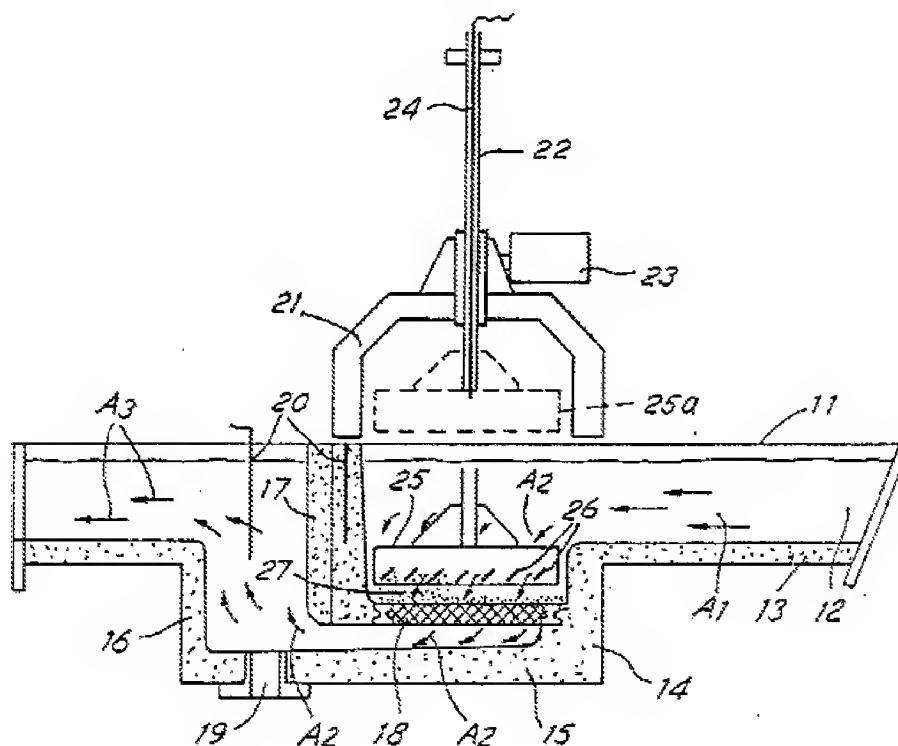


FIG. 4

In view of the disclosure of Enright, it would have been obvious to one skilled in the art to employ a cake formation agent in the system of Schneider, in order to enhance filtration and improve the efficiency of the system.

***Claim Rejections - 35 USC § 112***

Claims **21-68** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what specific manipulative steps Applicant regards as his invention. See 37 CFR 1.75(i).

It is unclear how Applicant ***“controls”*** cake formation.

It is unclear how Applicant's claimed ***“cake formation agent”*** differs from the claimed ***“grain refining agent.”*** It is unclear what function the ***“grain refining agent”*** performs in the context claimed.

Regarding those claims (e.g., 25,35,52) employing the phrase ***“such as,”*** its use renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 41 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not teach those skilled in the art how to accomplish the second separation recited in claim 41.

Any inquiry concerning this communication should be directed to /Robert James Popovics/ at telephone number (571) 272-1164.

**/Robert James Popovics/  
Primary Examiner  
Art Unit 1797**